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(54) Title: POLYOL COATED FOOD PRODUCTS

(57) Abstract: A coated foodstuff having a core and a hard coating around the core characterised in that the coating comprises at least 90% crystalline erythritol by weight and a method of making such a foodstuff comprising: (a) forming a core; (b) melting a coating material comprising at least 90% erythritol by weight; (c) applying the molten coating material around the core; and (d) solidifying the molten coating material to form a crystalline coating around the core.

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POLYOL COATED FOOD PRODUCTS

The present invention relates to a novel foodstuff, such as a confectionery product.

5 Confectionery products comprising a hard core surrounded by a hard sugar coating or shell are well known. The sugar coatings or shells of such products are commonly formed by hard panning cores in a rotary pan. In this process, a sugar syrup is sprayed over the cores to coat
10 them and the water in the syrup is then evaporated, typically in a flow of warm air, to crystallise the sugar as a hard, thin coating. The spraying and drying steps must be repeated several times in order to build up a sugar coating of satisfactory thickness. To allow each sugar layer to set
15 before the next is applied, significant drying times are required between successive syrup sprayings; this results in the overall hard panning process being slow. Furthermore, large quantities of well controlled drying air or conditioning equipment are required in order to evaporate
20 the water from the sugar syrup.

During hard panning, as the water is evaporated from the syrup to crystallise the sugar the viscosity of the syrup gradually increases.. This makes such coating techniques employing sugar syrups unsuitable for coating
25 soft, fragile cores; an increase in adhesiveness, associated with the increase in viscosity, causes the cores to stick to one another, tearing them apart. In addition, the use of sugar syrups in such techniques makes them unsuitable for coating cores which absorb sugar syrup or which are moisture
30 sensitive or hygroscopic.

Coated soft centres typically have soft coatings for example chocolate or soft panned sugar coatings, such as those on jelly beans.

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It has now been found that coated foodstuffs may be produced having hard, crystalline, sugar free coatings which resemble hard panned sugar coatings in texture and taste, and which are shiny or lustrous and so, in contrast to hard
5 panned sugar coatings, do not need to be polished to achieve an acceptable finish.

According to a first aspect of the invention there is provided a coated foodstuff having a core and a hard coating around the core characterised in that the coating comprises
10 at least 90% crystalline erythritol by weight.

Preferably the coating contains at least 95% crystalline erythritol by weight.

Preferably the coating further comprises up to 10% by weight of a second polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt, more
15 preferably up to 5% by weight of the second polyol. The inclusion of a second polyol improves the distribution of the coating over the core and provides a smoother coating than erythritol alone.

20 Preferably the thickness of the coating is about 1.0mm or less, more preferably about 0.5mm or less.

Preferably the coating is 50% or less by weight of the foodstuff, more preferably about 30% or less by weight of the foodstuff.

25 The coating may also comprise other common confectionery ingredients such as colourants, flavourants, acidulants, artificial sweeteners, preservatives and antioxidants. The coating may also comprise air, carbon dioxide, nitrogen, bicarbonate or other sources of gas.

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Preferably the core comprises a polyol, more preferably erythritol or xylitol.

Preferably the core contains between about 60% and about 90% erythritol or xylitol by weight, between about 2% and about 25% fat by weight and between about 2% and about 20% polyol syrup by weight, more preferably between about 75% and about 85% erythritol or xylitol by weight, between about 10% and about 20% fat by weight and between about 2% and about 10% polyol syrup by weight.

According to a second aspect of the present invention there is provided a method of manufacturing a coated foodstuff having a core and a hard coating around the core comprising: (a) forming a core; (b) melting a coating material comprising at least 90% erythritol by weight; (c) applying the molten coating material around the core; and (d) solidifying the molten coating material to form a crystalline coating around the core.

Preferably the method comprises dipping the core in the molten coating material or spraying the molten coating material onto the core.

Preferably the method comprises melting a coating material comprising at least 95% erythritol by weight.

Preferably the method comprises melting a coating material comprising at least 90% erythritol by weight and up to 10% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt by weight, more preferably melting a coating material comprising at least 95% erythritol by weight and up to 5% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

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It has also now been found that hard, crystalline coatings may be applied to fragile cores which cannot be coated using sugar syrups by conventional hard panning.

According to a third aspect of the present invention
5 there is provided a method of manufacturing a coated foodstuff having a fragile core and a hard coating around the fragile core comprising: forming a fragile core; melting a coating material consisting substantially of one or more polyols; applying the molten coating material around the
10 fragile core; and solidifying the molten coating material to form a crystalline coating around the fragile core.

The term fragile core is used throughout the specification to mean a core to which a hard panned sugar coating cannot be applied either because the core absorbs
15 sugar syrup or is moisture sensitive or hygroscopic and/or because the structural integrity of the core is insufficient to withstand the increase in viscosity and associated increase in adhesiveness which occurs as water is evaporated from a sugar syrup to crystallise the sugar. Examples of
20 fragile cores include soft fondants, marshmallows and frangible cores such as aerated or expanded products, including expanded malted balls such as the centres of Maltesers® made by Mars UK.

Preferably the method comprises dipping the core in the
25 molten coating material or spraying the molten coating material onto the core.

Preferably the method comprises melting a coating material comprising at least 90% erythritol or mannitol by weight, more preferably at least 95% erythritol or mannitol
30 by weight.

Preferably the method comprises melting a coating material comprising at least 90% erythritol or mannitol by

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weight and up to 10% by weight of at least one further polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt by weight, more preferably melting a coating material comprising at least 95% erythritol or mannitol by weight and up to 5% by weight of at least one further polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

The coating may also comprise other edible ingredients such as colourants, flavourants, acids, artificial sweeteners, preservatives and antioxidants. The coating may also comprise air, carbon dioxide, nitrogen, bicarbonate or other sources of gas.

Preferably the core comprises a polyol, more preferably erythritol or xylitol.

Preferably the core contains between about 60% and about 90% erythritol or xylitol by weight, between about 2% and about 25% fat by weight and between about 2% and about 20% polyol syrup by weight, more preferably between about 75% and about 85% erythritol or xylitol by weight, between about 10% and about 20% fat by weight and between about 2% and about 10% polyol syrup by weight.

Also according to a fourth aspect of the invention there is provided a coated foodstuff having a fragile core and a hard coating around the core characterised in that the coating consists substantially of a crystalline polyol.

Preferably the coating contains at least 90% crystalline erythritol or mannitol by weight, more preferably at least 95% crystalline erythritol or mannitol by weight.

Preferably the coating further comprises up to 10% by weight of a second polyol, being mannitol, erythritol,

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5 xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt, more preferably up to 5% by weight of the second polyol. The inclusion of a second polyol improves the distribution of the coating over the core and provides a smoother coating than erythritol or mannitol alone.

Preferably the thickness of the coating is about 1.0mm or less, more preferably about 0.5mm or less.

10 Preferably the coating is 50% or less by weight of the foodstuff, more preferably about 30% or less by weight of the foodstuff.

15 The coating may also comprise other common confectionery ingredients such as colourants, flavourants, acidulants, artificial sweeteners, preservatives and antioxidants. The coating may also comprise air, carbon dioxide, nitrogen, bicarbonate or other sources of gas.

Preferably the core comprises a polyol, more preferably erythritol or xylitol.

20 Preferably the core contains between about 60% and about 90% erythritol or xylitol by weight, between about 2% and about 25% fat by weight and between about 2% and about 20% polyol syrup by weight, more preferably between about 75% and about 85% erythritol or xylitol by weight, between about 10% and about 20% fat by weight and between about 2% and about 10% polyol syrup by weight.

25 Encapsulating cores with a thin, for example 0.5mm or less, coating of a molten polyol by the methods of the invention produces a robust shell which is tolerant to being worked, for example, processed, tumbled and packed. By reducing the thickness of the coating required to produce a satisfactory coating or shell, the invention enables coated
30 foodstuffs to be produced in which the proportion of the

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foodstuff made up of the core may be greatly increased compared to hard panned sugar coated products.

5 A number of polyols, such as xylitol and erythritol, are known to deliver a cooling effect in the mouth when consumed due to their high negative heats of solution. By using polyols, preferably erythritol, as coating materials in combination with polyol, preferably erythritol or xylitol, based cores such as fondants, the methods of the invention enable coated confectioneries which deliver an intense cooling effect and which have improved cooling power over 10 known polyol containing products to be manufactured; upon ingestion, the polyol based fondant may disappear rapidly, but the cooling effect delivered by the crystalline polyol coating continues.

15 By using polyols as the coating material in the methods of the invention it is possible to produce hard, crystalline coatings which are sugar free.

The invention will be further described, by way of the following examples of specific embodiments thereof:

20 Example 1

Spherical fondant cores, 0.5 to 1.5cm in diameter, comprising, by weight, 80.7% icing sugar, 8.7% hydrogenated vegetable fat, 8.2% invert syrup and 2.4% colourant and flavourant are mounted on wooden sticks and dipped in bath of 25 molten erythritol at 130°C, containing 0.25% by weight of aqueous 10% quinoline yellow solution, and then chilled in a refrigerator at 0-5°C for 5 to 10 minutes. The cores are then removed from the refrigerator and the dipping and chilling steps repeated twice.

Example 2

2.5kg of the spherical fondant cores of Example 1, 0.5 to 1.5cm in diameter, are placed in a rotating pan and sprayed or dribbled with 60g to 80g of molten erythritol at 130°C, containing 0.25% by weight of aqueous 10% quinolline yellow solution. Cold air at 0-5°C is then applied to the tumbling cores for 10 minutes. The dribbling/spraying and cooling steps are then repeated three times.

Example 3

Spherical fondant cores, 0.5 to 1.5cm in diameter, comprising 80.6% erythritol, 6.0% hydrogenated vegetable fat, 12.0% maltitol syrup (80% solids), 1.0% citric acid, 0.2% of aqueous 10% quinolline yellow solution and 0.2% flavourant are dropped into a bath of molten erythritol at 130°C, containing 0.25% by weight of aqueous 10% quinolline yellow solution and 1.8% by weight 50/50 citric acid/malic acid blend. The cores are then recovered from the bath using a fork and rolled along a flat metallic bench. The cores are then cooled for 5 to 10 minutes either in a refrigerator at 0-5°C or with cold air at 0-5°C. The dipping, rolling and cooling steps are then repeated.

Example 4

Spherical fondant cores, 0.5 to 1.5cm in diameter, comprising, by weight, 82.3% xylitol, 12.0% hydrogenated vegetable fat, 4.0% sorbitol syrup (70% solids), 1.3% citric acid, 0.2% of aqueous 10% quinolline yellow solution and 0.2% flavourant are dropped into a bath of molten erythritol at 130°C, containing 0.25% by weight of aqueous 10% quinolline yellow solution and 1.8% by weight 50/50 citric acid/malic acid blend. The cores are then recovered from the bath using a fork and rolled along a flat metallic bench. The cores are then cooled for 5 to 10 minutes either in a refrigerator at 0-5°C or with cold air at 0-5°C. The dipping, rolling and cooling steps are then repeated three times.

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Example 1 produced coated foodstuffs consisting of a spherical fondant core surrounded by a hard, smooth, brittle coating. The coating exhibited a yellow/orange pearlescent character.

5 In Example 2, the molten erythritol solidified almost instantaneously upon coming into contact with the fondant cores and the cores showed no tendency to adhere to one another. The coated foodstuffs produced consisted of a fondant core surrounded by a hard, brittle coating that
10 exhibited a yellow/orange pearlescent character.

In Examples 3 and 4, during the rolling steps the molten erythritol did not adhere to the metallic bench, while the coated foodstuffs remained intact.

Examples 3 and 4 produced coated foodstuffs, each
15 weighing 1.3g, consisting of a fondant core surrounded by a hard, strong, 0.5mm thick coating. The coating was 40% by weight of the foodstuff. Once again, the coating exhibited a yellow/orange pearlescent character. The cooling effects delivered by the polyol based fondant cores were enhanced and
20 prolonged by the cooling effect of the crystalline erythritol coating.

Although in the above Examples the fragile cores were coated using molten erythritol, the same techniques may be employed to coat fragile cores with molten mannitol or with
25 a molten mixture of erythritol or mannitol and a second polyol. It will be appreciated that if molten mannitol is used instead of molten erythritol a higher temperature must be employed due to the higher melting point of mannitol compared to erythritol, 167°C and 124°C respectively.

30 Inclusion of up to 5% by weight of a second polyol, being erythritol, mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt, leads to a

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reduction in melting point of about 17°C, such that the resultant erythritol and mannitol based mixtures melt at 107°C and 150°C respectively.

In all of the above Examples, aqueous 10% quinoline
5 yellow solution was added to the molten erythritol in order to aid visual assessment of the quality of the coatings produced. It will be readily appreciated that a variety of colourants, flavourants, acidulants, artificial sweeteners, preservatives, antioxidants and edible additives may be added
10 to the molten coating, provided that where the coating is being used to coat fragile cores the liquid coating material still solidifies rapidly to a crystalline form with substantially no increase in viscosity. It will further be appreciated that insoluble colourants or other additives may
15 be employed as dispersion in the molten coating material without the need for solution. Air, carbon dioxide, nitrogen, bicarbonate or other sources of gas may also be incorporated into the coating to give an aerated effect if desired.

20 While fondant cores are employed in the Examples given above, it will be readily appreciated by those skilled in the art that hard, shiny or lustrous coatings comprising at least 90% crystalline erythritol by weight may similarly be formed on a variety of other soft and hard cores such as hard candy,
25 chocolate, chewing gum tablets, toffees, popcorn and expanded centres formed by vacuum raising or gas evolution.

It will also be appreciated that while hydrogenated vegetable fat is employed in the fondant cores in the above Examples, other fats, such as lauric fats could alternatively
30 be employed. A preferred hydrogenated vegetable fat is that known as General purpose Fat Extra Hard.

Similarly, while in the Examples above the cores are spherical, it will be readily appreciated that cores having

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other shapes could be employed, such as, for example, cuboid, toroidal, egg-shaped, pillow-shaped, almond-shaped or torpedo-shaped cores. The application of successive layers of viscous sugar syrup to cores in known coating methods, such as hard panning, tends to increase the roundness of the cores. Consequently, when employing such methods it is difficult to produce a coated confectionery whose overall shape conforms to that of the core if the core is significantly non-spherical. The use of a coating material comprising a polyol that melts to give a low viscosity liquid, which solidifies rapidly to a crystalline form with substantially no increase in viscosity, in the methods of the present invention mitigates this problem, particularly when the coating is formed by dipping the core in the molten coating material.

By eliminating the need for viscous syrups, the method of the invention enables foodstuffs having fragile cores and hard, crystalline coatings to be produced. By eliminating the need for sugar syrups containing water, the method of the invention also enables foodstuffs having hard, crystalline coatings and cores which absorb sugar syrup or which are moisture sensitive or hygroscopic to be produced.

A second coating, which may be incompatible with the core, can then be applied to the coated core. For example, a fragile hygroscopic core can be encased within a polyol coating by the method of the invention and then a further aqueous coating, such as a sugar syrup coating, may be applied to the coated core.

As the methods of the present invention do not involve the evaporation of water from a sugar syrup, the need for large quantities of well controlled drying air or conditioning equipment, as required in hard panning processes, is also eliminated.

As the molten coating material solidifies rapidly, the methods of the invention also enable cores to be coated in much reduced times compared to those required with hard panning techniques.

CLAIMS

1. A coated foodstuff having a core and a hard coating around the core characterised in that the coating comprises at least 90% crystalline erythritol by weight.
- 5 2. A foodstuff according to claim 1 wherein the coating comprises at least 95% crystalline erythritol by weight.
3. A foodstuff according to claim 1 wherein the coating further comprises up to 10% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol,
10 lactitol, isomaltulose or isomalt.
4. A foodstuff according to claim 2 wherein the coating further comprises up to 5% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.
- 15 5. A foodstuff according to any preceding claim wherein the thickness of the coating is 1.0mm or less.
6. A foodstuff according to any preceding claim wherein the thickness of the coating is 0.5mm or less.
7. A foodstuff according to any preceding claim wherein the
20 coating is 50% or less by weight of the foodstuff.
8. A foodstuff according to any preceding claim wherein the coating is 30% or less by weight of the foodstuff.
9. A foodstuff according to any preceding claim wherein the core is a fragile core.
- 25 10. A foodstuff according to any preceding claim wherein the core is a soft fondant.

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11. A foodstuff according to any preceding claim wherein the core comprises a polyol.
12. A foodstuff according to any preceding claim wherein the core comprises erythritol or xylitol.
- 5 13. A foodstuff according to any preceding claim wherein the core contains between 75% and 85% erythritol or xylitol by weight, between 10% and 20% fat by weight and between 2% and 10% polyol syrup by weight.
- 10 14. A confectionery product according to any preceding claim.
- 15 15. A method of manufacturing a coated foodstuff having a core and a hard coating around the core comprising:
 (a) forming a core;
 (b) melting a coating material comprising at least 90% erythritol by weight;
 (c) applying the molten coating material around the core; and
 (d) solidifying the molten coating material to form a crystalline coating around the core.
- 20 16. A method according to claim 15 wherein step (c) comprises dipping the core in the molten coating material.
17. A method according to claim 15 wherein step (c) comprises spraying the molten coating material onto the core.
- 25 18. A method according to claim 15, 16 or 17 wherein step (b) comprises melting a coating material comprising at least 90% erythritol by weight and up to 10% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

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19. A method according to claim 15, 16 or 17 wherein step (b) comprises melting a coating material comprising at least 95% erythritol by weight.

20. A method according to claim 19 wherein step (b) comprises melting a coating material comprising at least 95% erythritol by weight and up to 5% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

21. A method of manufacturing a coated foodstuff having a fragile core and a hard coating around the core comprising:

- (a) forming a fragile core;
- (b) melting a coating material consisting substantially of one or more polyols;
- (c) applying the molten coating material around the fragile core; and
- (d) solidifying the molten coating material to form a crystalline coating around the fragile core.

22. A method according to claim 21 wherein step (c) comprises dipping the fragile core in the molten coating material.

23. A method according to claim 21 wherein step (c) comprises spraying the molten coating material onto the fragile core.

24. A method according to claim 21, 22 or 23 wherein step (b) comprises melting a coating material comprising at least 90% erythritol or mannitol by weight.

25. A method according to any of claims 21 to 24 wherein step (b) comprises melting a coating material comprising at least 95% erythritol or mannitol by weight.

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26. A method according to claim 24 wherein step (b) comprises melting a coating material comprising at least 90% erythritol or mannitol by weight and up to 10% by weight of at least one further polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

27. A method according to claim 25 wherein step (b) comprises melting a coating material comprising at least 95% erythritol or mannitol by weight and up to 5% by weight of at least one further polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

29. A method according to any of claims 20 to 28 of manufacturing a coated foodstuff having a fragile core comprising a polyol wherein step (a) comprises forming a fragile core comprising a polyol.

30. A method according to claim 29 of manufacturing a coated foodstuff having a fragile core comprising erythritol or xylitol wherein step (a) comprises forming a fragile core comprising erythritol or xylitol.

31. A method according to any of claims 21 to 30 of manufacturing a coated soft fondant, marshmallow or expanded or aerated confectionery product comprising:

(a) forming a soft fondant, marshmallow or expanded or aerated confectionery product;

(b) melting a coating material comprising a polyol;

(c) applying the molten coating material around the soft fondant, marshmallow or expanded or aerated confectionery product; and

(d) solidifying the molten coating material to form a crystalline coating around the soft fondant, marshmallow or expanded or aerated confectionery product.

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32. A method according to claim 31 of manufacturing a coated soft fondant wherein step (a) comprises forming a soft fondant comprising between 75% and 85% erythritol or xylitol by weight, between 10% and 20% fat by weight and between 2%
5 and 10% polyol syrup by weight.

33. A method according to any of claims 21 to 32 further comprising applying a further coating material to the coated core formed in step (d).

34. A method according to claim 33 comprising applying a
10 sugar syrup to the coated core formed in step (d).

35. A coated foodstuff having a fragile core and a hard coating around the core characterised in that the coating consists substantially of one or more crystalline polyols.

36. A coated foodstuff according to claim 35 wherein the
15 core is a soft, fondant, marshmallow or expanded or aerated confectionery product.

37. A coated foodstuff according to claim 35 or 36 wherein the coating comprises at least 90% crystalline erythritol or mannitol by weight.

20 38. A coated foodstuff according to claim 35, 36 or 37 wherein the coating comprises at least 95% crystalline erythritol or mannitol by weight.

39. A coated foodstuff according to claim 37 wherein the coating further comprises up to 10% by weight of a second
25 polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

39. A coated foodstuff according to claim 38 wherein the coating further comprises up to 5% by weight of a second

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polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

40. A coated foodstuff substantially as described with reference to the examples.

5 41. A method of manufacturing a coated foodstuff substantially as described with reference to the examples.

AMENDED CLAIMS

[Received by the International Bureau on 06 January 2004 (06.01.04):
original claims 1 and 35 amended; original claims 39, 39, 40 and 41
renumbered 39-42; remaining claims unchanged; (3 pages)]

CLAIMS

1. A coated foodstuff having a core and a hard coating comprising at least 90% crystalline erythritol by weight around the core characterised in that the coating is a solidified melt.
2. A foodstuff according to claim 1 wherein the coating comprises at least 95% crystalline erythritol by weight.
3. A foodstuff according to claim 1 wherein the coating further comprises up to 10% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.
4. A foodstuff according to claim 2 wherein the coating further comprises up to 5% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.
5. A foodstuff according to any preceding claim wherein the thickness of the coating is 1.0mm or less.
6. A foodstuff according to any preceding claim wherein the thickness of the coating is 0.5mm or less.
7. A foodstuff according to any preceding claim wherein the coating is 50% or less by weight of the foodstuff.
8. A foodstuff according to any preceding claim wherein the coating is 30% or less by weight of the foodstuff.
9. A foodstuff according to any preceding claim wherein the core is a fragile core.
10. A foodstuff according to any preceding claim wherein the core is a soft fondant.

32. A method according to claim 31 of manufacturing a coated soft fondant wherein step (a) comprises forming a soft fondant comprising between 75% and 85% erythritol or xylitol by weight, between 10% and 20% fat by weight and between 2% and 10% polyol syrup by weight.

33. A method according to any of claims 21 to 32 further comprising applying a further coating material to the coated core formed in step (d).

34. A method according to claim 33 comprising applying a sugar syrup to the coated core formed in step (d).

35. A coated foodstuff having a fragile core and a hard coating consisting substantially of one or more crystalline polyols around the core characterised in that the coating is a solidified melt.

36. A coated foodstuff according to claim 35 wherein the core is a soft, fondant, marshmallow or expanded or aerated confectionery product.

37. A coated foodstuff according to claim 35 or 36 wherein the coating comprises at least 90% crystalline erythritol or mannitol by weight.

38. A coated foodstuff according to claim 35, 36 or 37 wherein the coating comprises at least 95% crystalline erythritol or mannitol by weight.

39. A coated foodstuff according to claim 37 wherein the coating further comprises up to 10% by weight of a second polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

40. A coated foodstuff according to claim 38 wherein the coating further comprises up to 5% by weight of a second

polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

41. A coated foodstuff substantially as described with reference to the examples.

42. A method of manufacturing a coated foodstuff substantially as described with reference to the examples.

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CLAIMS

1. A coated foodstuff having a core and a hard coating around the core characterised in that the coating comprises at least 90% crystalline erythritol by weight.
- 5 2. A foodstuff according to claim 1 wherein the coating comprises at least 95% crystalline erythritol by weight.
3. A foodstuff according to claim 1 wherein the coating further comprises up to 10% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol,
10 lactitol, isomaltulose or isomalt.
4. A foodstuff according to claim 2 wherein the coating further comprises up to 5% by weight of at least one further polyol, being mannitol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.
- 15 5. A foodstuff according to any preceding claim wherein the thickness of the coating is 1.0mm or less.
6. A foodstuff according to any preceding claim wherein the thickness of the coating is 0.5mm or less.
7. A foodstuff according to any preceding claim wherein the
20 coating is 50% or less by weight of the foodstuff.
8. A foodstuff according to any preceding claim wherein the coating is 30% or less by weight of the foodstuff.
9. A foodstuff according to any preceding claim wherein the core is a fragile core.
- 25 10. A foodstuff according to any preceding claim wherein the core is a soft fondant.

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26. A method according to claim 24 wherein step (b) comprises melting a coating material comprising at least 90% erythritol or mannitol by weight and up to 10% by weight of at least one further polyol, being mannitol, erythritol, 5 xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

27. A method according to claim 25 wherein step (b) comprises melting a coating material comprising at least 95% erythritol or mannitol by weight and up to 5% by weight of at 10 least one further polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

29. A method according to any of claims 20 to 28 of manufacturing a coated foodstuff having a fragile core 15 comprising a polyol wherein step (a) comprises forming a fragile core comprising a polyol.

30. A method according to claim 29 of manufacturing a coated foodstuff having a fragile core comprising erythritol or xylitol wherein step (a) comprises forming a fragile core 20 comprising erythritol or xylitol.

31. A method according to any of claims 21 to 30 of manufacturing a coated soft fondant, marshmallow or expanded or aerated confectionery product comprising:

(a) forming a soft fondant, marshmallow or expanded or 25 aerated confectionery product;

(b) melting a coating material comprising a polyol;

(c) applying the molten coating material around the soft fondant, marshmallow or expanded or aerated confectionery product; and

30 (d) solidifying the molten coating material to form a crystalline coating around the soft fondant, marshmallow or expanded or aerated confectionery product.

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32. A method according to claim 31 of manufacturing a coated soft fondant wherein step (a) comprises forming a soft fondant comprising between 75% and 85% erythritol or xylitol by weight, between 10% and 20% fat by weight and between 2%
5 and 10% polyol syrup by weight.

33. A method according to any of claims 21 to 32 further comprising applying a further coating material to the coated core formed in step (d).

34. A method according to claim 33 comprising applying a
10 sugar syrup to the coated core formed in step (d).

35. A coated foodstuff having a fragile core and a hard coating around the core characterised in that the coating consists substantially of one or more crystalline polyols.

36. A coated foodstuff according to claim 35 wherein the
15 core is a soft, fondant, marshmallow or expanded or aerated confectionery product.

37. A coated foodstuff according to claim 35 or 36 wherein the coating comprises at least 90% crystalline erythritol or mannitol by weight.

20 38. A coated foodstuff according to claim 35, 36 or 37 wherein the coating comprises at least 95% crystalline erythritol or mannitol by weight.

39. A coated foodstuff according to claim 37 wherein the coating further comprises up to 10% by weight of a second
25 polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

39. A coated foodstuff according to claim 38 wherein the coating further comprises up to 5% by weight of a second

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polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

40. A coated foodstuff substantially as described with reference to the examples.

5 41. A method of manufacturing a coated foodstuff substantially as described with reference to the examples.

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32. A method according to claim 31 of manufacturing a coated soft fondant wherein step (a) comprises forming a soft fondant comprising between 75% and 85% erythritol or xylitol by weight, between 10% and 20% fat by weight and between 2% and 10% polyol syrup by weight.

33. A method according to any of claims 21 to 32 further comprising applying a further coating material to the coated core formed in step (d).

34. A method according to claim 33 comprising applying a sugar syrup to the coated core formed in step (d).

35. A coated foodstuff having a fragile core and a hard coating consisting substantially of one or more crystalline polyols around the core characterised in that the coating is a solidified melt.

36. A coated foodstuff according to claim 35 wherein the core is a soft, fondant, marshmallow or expanded or aerated confectionery product.

37. A coated foodstuff according to claim 35 or 36 wherein the coating comprises at least 90% crystalline erythritol or mannitol by weight.

38. A coated foodstuff according to claim 35, 36 or 37 wherein the coating comprises at least 95% crystalline erythritol or mannitol by weight.

39. A coated foodstuff according to claim 37 wherein the coating further comprises up to 10% by weight of a second polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

40. A coated foodstuff according to claim 38 wherein the coating further comprises up to 5% by weight of a second

polyol, being mannitol, erythritol, xylitol, sorbitol, maltitol, lactitol, isomaltulose or isomalt.

41. A coated foodstuff substantially as described with reference to the examples.

42. A method of manufacturing a coated foodstuff substantially as described with reference to the examples.

INTERNATIONAL SEARCH REPORT

Internatl Application No
PCT/GB 03/03162

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23L1/09 A23P1/08 A23G3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A23L A23P A23G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 556 814 A (ROSENTHAL HAROLD ET AL) 19 January 1971 (1971-01-19) the whole document	21-23, 31, 35, 36
X	US 3 552 979 A (KRUSE NORMAN F) 5 January 1971 (1971-01-05) the whole document	35
X	US 4 146 653 A (MADER HELMUT ET AL) 27 March 1979 (1979-03-27) the whole document	21, 23, 35
X	US 3 477 858 A (MELNICK DANIEL ET AL) 11 November 1969 (1969-11-11) the whole document	35, 37-39
	-/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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G document member of the same patent family

Date of the actual completion of the International search

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INTERNATIONAL SEARCH REPORT

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PCT/GB 03/03162

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 305 356 A (LEJUS MEDICAL AB) 1 March 1989 (1989-03-01) the whole document -----	21, 23, 29-31, 35, 36
X	US 5 580 601 A (RIBADEAU-DUMAS GUILLAUME ET AL) 3 December 1996 (1996-12-03) column 3, line 61 - line 67 column 7, line 53 - line 61 -----	35, 36
X	US 3 769 438 A (LYNCH M ET AL) 30 October 1973 (1973-10-30) the whole document -----	35, 36
X	WO 95 07625 A (WRIGLEY W M JUN CO ; TYRPIN HENRY T (US); BRODERICK KEVIN B (US); MEYE) 23 March 1995 (1995-03-23) claims examples -----	1-14, 35-39
X	US 5 900 261 A (SERPELLONI MICHEL ET AL) 4 May 1999 (1999-05-04) column 5, line 43 - column 6, line 34 examples -----	35, 36

INTERNATIONAL SEARCH REPORT

Internat Application No
PCT/GB 03/03162

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3556814	A	19-01-1971	NONE	
US 3552979	A	05-01-1971	NONE	
US 4146653	A	27-03-1979	DE 2636152 A1	06-10-1977
			AT 352884 B	10-10-1979
			AT 584277 A	15-03-1979
			AU 510921 B2	17-07-1980
			AU 2768777 A	15-02-1979
			BE 857659 A1	01-12-1977
			CA 1086650 A1	30-09-1980
			CH 630259 A5	15-06-1982
			ES 461516 A1	16-07-1978
			FR 2361105 A1	10-03-1978
			GB 1547527 A	20-06-1979
			HU 176597 B	28-03-1981
			IT 1086479 B	28-05-1985
			JP 1134821 C	14-02-1983
			JP 53020416 A	24-02-1978
			JP 57025007 B	27-05-1982
			NL 7708808 A	14-02-1978
			SE 431935 B	12-03-1984
			SE 7709050 A	12-02-1978
US 3477858	A	11-11-1969	DE 1692600 A1	16-03-1972
EP 0305356	A	01-03-1989	SE 463541 B	10-12-1990
			AT 64548 T	15-07-1991
			CA 1318482 C	01-06-1993
			DE 3863328 D1	25-07-1991
			EP 0305356 A1	01-03-1989
			SE 8703358 A	01-03-1989
			US 4937080 A	26-06-1990
US 5580601	A	03-12-1996	FR 2714796 A1	13-07-1995
			AT 179050 T	15-05-1999
			AU 682912 B2	23-10-1997
			AU 1009995 A	20-07-1995
			DE 69509138 D1	27-05-1999
			DE 69509138 T2	14-10-1999
			DK 662285 T3	25-10-1999
			EP 0662285 A1	12-07-1995
			ES 2131777 T3	01-08-1999
			FI 950087 A	11-07-1995
			GR 3030484 T3	29-10-1999
			IL 112287 A	30-10-1998
			JP 8033451 A	06-02-1996
			NO 950084 A	11-07-1995
US 3769438	A	30-10-1973	JP 51017177 B	31-05-1976
WO 9507625	A	23-03-1995	WO 9508925 A1	06-04-1995
			WO 9507622 A1	23-03-1995
			AU 680316 B2	24-07-1997
			AU 8070894 A	03-04-1995
			CA 2170498 A1	23-03-1995
			DE 69431261 D1	02-10-2002
			DE 69431261 T2	17-04-2003

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB 03/03162

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9507625	A	DK 785724 T3	06-01-2003
		EP 0785724 A1	30-07-1997
		JP 9502615 T	18-03-1997
		WO 9507625 A1	23-03-1995
		US 5536511 A	16-07-1996
		US 5603970 A	18-02-1997
		AU 685508 B2	22-01-1998
		AU 7687394 A	03-04-1995
		AU 677725 B2	01-05-1997
		AU 7925594 A	18-04-1995
		AU 697906 B2	22-10-1998
		AU 7960194 A	18-04-1995
		CA 2170499 A1	23-03-1995
		CA 2170500 A1	06-04-1995
		CA 2171617 A1	06-04-1995
		DE 69331282 D1	17-01-2002
		DE 69331282 T2	23-05-2002
		DE 69409817 D1	28-05-1998
		DE 69409817 T2	29-10-1998
		DE 69422820 D1	02-03-2000
		DE 69422820 T2	21-06-2000
		DE 69426983 D1	03-05-2001
		DE 69426983 T2	19-07-2001
		DK 726713 T3	04-03-2002
		DK 719094 T3	02-06-1998
		DK 721302 T3	30-04-2001
		EP 0726713 A1	21-08-1996
		EP 0719094 A1	03-07-1996
		EP 0723401 A1	31-07-1996
		EP 0721302 A1	17-07-1996
		WO 9507624 A1	23-03-1995
		WO 9508928 A1	06-04-1995
		WO 9508929 A1	06-04-1995
		US 5397579 A	14-03-1995
		US 6264999 B1	24-07-2001
		US 5916606 A	29-06-1999
		AU 677604 B2	01-05-1997
		AU 5162093 A	03-04-1995
		DE 69328039 D1	13-04-2000
		DE 69328039 T2	13-07-2000
		DK 719093 T3	05-06-2000
		EP 0719093 A1	03-07-1996
		US 5665406 A	09-09-1997
US 5900261	A 04-05-1999	FR 2740300 A1	30-04-1997
		AT 216190 T	15-05-2002
		AU 716114 B2	17-02-2000
		AU 7046896 A	08-05-1997
		AU 7498096 A	22-05-1997
		CA 2189094 A1	01-05-1997
		CN 1202803 A , B	23-12-1998
		DE 69620712 D1	23-05-2002
		DE 69620712 T2	02-10-2003
		DK 774210 T3	29-07-2002
		EP 0774210 A1	21-05-1997
		ES 2175049 T3	16-11-2002
		WO 9716074 A1	09-05-1997
		IL 124212 A	21-11-2000

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/03162

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5900261	A	NO 964585 A	02-05-1997
		PL 326447 A1	28-09-1998
		PT 774210 T	30-09-2002
		RU 2176885 C2	20-12-2001
		TR 9800761 T2	21-07-1998
